

BROOKHAVEN NATIONAL LABORATORY

ENVIRONMENT, SAFETY, AND HEALTH STANDARD

PESTICIDES	2.1.3
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I. INTRODUCTION

Although pesticides (insecticides, herbicides, rodenticides, nematocides, fungicides, etc.) provide a means for controlling the proliferation of insects, weeds and other pests, their intrinsic toxic properties pose potential occupational and environmental health hazards. The purpose of this Standard is to ensure that work requiring the use of pesticides is performed in a safe manner.

II. SCOPE

This Standard describes procedures which will ensure that on-site handling, storage, mixing, application, transport, and disposal of pesticides are performed in a manner that minimizes the risk to the user, to others who may be exposed, and to the environment.

III. DEFINITIONS

Adequate storage means the containment of a pesticide in a proper container within a secured area in a manner that will minimize the risks of employee exposure and of adverse effects to the environment.

Contaminated means the contact of a pesticide with the body, clothing, equipment, or the ground.

Detoxification means processes which will convert pesticides into nontoxic compounds.

Field application is the act of applying pesticides to a piece of open or cleared ground that is suitable for pasture or tillage.

Highly toxic pesticides are commercial poisons which are labeled "DANGER" or "POISON" in accordance with the Federal Environmental Pesticide Control Act.

Moderately toxic pesticides are commercial poisons which are labeled "WARNING" in accordance with the Federal Environmental Pesticide Control Act.

Low toxicity pesticides are commercial poisons which are labeled "CAUTION" in accordance with the Federal Environmental Pesticide Control Act.

Open burning means the combustion of pesticides, pesticide-contaminated materials, or pesticide containers in any fashion other than by incineration.

Open dumping is the placement of pesticides, pesticide-contaminated materials or containers on a **landsite** in a manner that leaves the environment unprotected and exposes the toxic materials to the elements, vectors, and scavengers.

Pesticide is defined as any substance or mixture of substances intended (1) for preventing, destroying, repelling, or mitigating any pest, or (2) for use as a plant regulator, defoliant, or desiccant.



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Re-entry safety interval is the period that must elapse between the time the pesticide is applied and the time personnel may safely re-enter the treated area without the use of protective equipment.

IV. RESPONSIBILITIES

A. Department Chairperson/Division Heads are responsible for ensuring implementation of this Standard.

B. Department/Division ES&H Coordinators (or their designees) shall make verbal or written requests to the Plant Engineering Division for pesticide application service in their respective department or division.

C. Line Supervisors, whose subordinates are classified as pesticide workers, are responsible for the direct implementation of this Standard. Specifically, line supervisors shall:

1. ensure that all persons designated as pesticide workers have received sufficient training from a certified applicator to perform their work safely and are knowledgeable of the requirements in this Standard;
2. on an annual basis, provide the Safety and Environmental Protection representative and the Occupational Medicine Clinic with a list of all personnel who work with pesticides;
3. on an annual basis, provide the Environmental Monitoring Group in the Safety and Environmental Protection Division with a list of the amounts of specific pesticides used on site;
4. ensure that only pesticides registered with the EPA are used;
5. ensure that all pesticides and pesticide-contaminated materials for disposal are labeled as outlined in Part V.B. of this Standard;
6. be cognizant of the emergency procedures set forth in this Standard;
7. ensure possession of a current, valid purchase permit from the NY Department of Environmental Conservation for the purchase, possession, and use of restricted pesticides, and
8. provide the Safety and Environmental Protection Division Representative with floor plans of storage areas indicating where pesticides are regularly stored.

D. Occupational Medicine Clinic is responsible for assisting in the implementation of this Standard. Specifically, the Occupational Medicine Clinic shall:

1. perform the appropriate medical examinations for all persons whose duties involve potential exposure to pesticides, and
2. inform Safety and Environmental Protection of groups and/or areas where overexposures are suspected.

E. Safety and Environmental Protection Division is responsible for assisting in the implementation of this Standard. Specifically, the Safety and Environmental Protection Division shall:

1. provide technical assistance and recommend engineering and administrative controls and personal protective measures for the safe use of pesticides,
2. audit for compliance with this Standard.
3. provide for the cleansing and disposal of pesticides containers and for the disposal of unwanted and unusable pesticides.
4. The **S&EP** Representative shall notify the Industrial Hygiene and Fire Rescue Groups of all pesticide storage areas.

V. REQUIREMENTS

Many pesticides are not highly selective, and thus they can be hazardous to nontarget species including humans. Since few target-selective pesticides exist, the choice of a pesticide must often be determined on the

basis of which pesticide presents the least risk to nontarget organisms, or which pesticide can be used with an application rate that will not injure nontarget species.

A. Selection of the Proper Pesticide

1. Only pesticides registered with the EPA shall be selected.
2. The selected pesticides shall be used only for the purposes and at the application rate specified on the container label.
3. In selecting a pesticide, consider (a) the characteristics of the application site, (b) the amount of pesticide to be used, (c) the drainage from the site and the potential for contamination of surface and ground waters, and (d) the containment of windblown pesticide dusts or **particulates** during outdoor applications.
4. When other factors are equal, the least hazardous pesticide shall be selected.

B. Warning Labels

1. The label on the original container will normally show the signal words "Danger," "Poison," or "Warning," or the skull and crossbone symbol when highly toxic or moderately toxic pesticides are contained therein. It should specify a re-entry safety interval when applicable, the recommended application for specific operations, requirements for personal protective equipment, and first aid measures. If such information is missing from the label, it shall be added by the user with assistance from the Safety and Environmental Protection Division as required.
2. New labels for use on secondary containers and containers of diluted solutions of pesticides shall include all pertinent information carried on the original manufacturer's label and, in addition, the date prepared, by whom it was prepared, the concentration, the intended application, and the date when it should be destroyed.

C. Signs

1. For agriculture field application of pesticides, a warning sign shall be posted at each established approach to the application area prior to the pesticide application. The sign shall be removed at the end of the re-entry safety interval. In a treatment area, a sweep shall be made immediately prior to the pesticide application to ensure that the area is free of personnel. The warning sign shall be conspicuously posted and shall specify the following information:

D A N G E R P E S T I C I D E A R E A

- a) DO NOT ENTER
 - b) Name of pesticide
 - c) Date and time of application
 - d) Earliest re-entry time ("Do not enter before _____")
2. For other outdoor applications of pesticides for insect control Plant Engineering will post warning signs following spraying. They will remove the signs after drying.
 3. Signs shall be conspicuously posted to prohibit unauthorized persons from entering pesticide mixing, storage, and disposal areas and pesticide equipment storage areas. Such signs shall be placed at entrances to rooms and buildings and/or on area enclosures to advise of the contents and warn of their hazardous nature in accordance with ES&H Standard 1.10.0.

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D. Storage

1. Pesticide containers shall be stored with the label plainly visible. If the containers are not in good condition when received, the contents shall be transferred to an undamaged, properly labeled container.
2. Containers shall be checked regularly for corrosion and leaks. If a container is found to be in poor condition, the contents should be transferred to a suitable container and labeled properly.
3. Storage sites shall be selected with due regard to the amount, toxicity, and environmental hazard of the pesticide.
4. Storage facilities for pesticides should be dry, well-ventilated, enclosed areas.
5. The entire storage facility shall be secured to prevent unauthorized entry.

E. Handling

1. Mixing

- a. Selection of the appropriate workplace shall be in accordance with ES&H Standard 2.2.1.
- b. When mixing highly toxic pesticides (i.e., those labeled "Danger" or "Poison"), another person should be in the area to provide assistance in the event of an accident.
- c. Emergency eye wash facilities shall be located at each indoor mixing facility. The eyewash station shall be designed such that both eyes can be flushed simultaneously for 15 minutes while both hands are free to hold the eyes open. Emergency shower facilities and hand wash facilities shall be provided where feasible.
- d. All pesticide applying equipment which draws water directly from any water source shall have an effective backflow prevention system.

2. Application

- a. Pesticides shall be applied only in the amount needed and in a manner consistent with its labeling.
- b. When applying highly toxic pesticides (i.e., those labeled "Danger" or "Poison"), two people shall be within sight of each other.
- c. Pesticides classified for "Restricted Use" by the EPA shall be applied only by competent persons under the direct supervision of an individual possessing training and certification from the state of New York in the proper application of such pesticides. The certified applicator need not be physically present at the time and place the pesticide is applied as long as he is available if and when needed.
- d. Domestic/laboratory animals should be kept out of the treated area.
- e. Where an area is treated with more than one pesticide, entry into that area shall be prohibited until after the passage of the longest of the applicable re-entry safety intervals.
- f. If a building or similar enclosed space is to be fumigated it shall not be occupied by human beings during the time of fumigation or until the re-entry safety interval has elapsed. Use of fumigants must be in accordance with Chapter 10 "Fumigation" of the National Fire Code.
- g. Pesticides shall not be applied in such a manner and under such wind and other conditions that could contaminate the operator or an adjacent area where spraying is not planned.
- h. Applications shall not be performed in a manner that could cause pesticides to be entrained in the air intake systems of buildings.

3. Transportation

- a. Containers filled or contaminated with pesticides shall be transported in official vehicles. Personal vehicles may not be used to transport such items. Placement in the vehicle shall be such that the containers do not shift, roll around, or bounce while being transported.

4. Disposal

- a. The disposal of pesticides, empty pesticide containers, or pesticide equipment unsuitable for further use shall be in accordance with ES&H Standard 6.2.0 entitled "Hazardous Waste".
- b. No pesticide container shall be sold or reused for any other purpose.

F. Personnel Practices

1. Protective Clothing

a. Selection and Use of Protective Clothing

- 1) Selection of the required protective clothing depends on the properties and the toxicity of the pesticide, the method by which it is mixed and applied, and the area to be treated. Recommendations for protective clothing are stated on the pesticide label. These recommendations shall be accepted as the minimum BNL standard.
- 2) The appropriate personal protective equipment shall be worn by applicators and by all persons who enter a treated area before the expiration of the re-entry safety interval.
- 3) When the protective clothing becomes contaminated with pesticide to the degree that the skin could become contaminated, the clothing shall be removed and the skin washed.
- 4) Extra sets of clean protective clothes shall be available for all field operations where highly toxic pesticides are being used. The clean clothes and equipment shall be protected from contamination prior to use.
- 5) Protective clothing used for pesticide operations shall be assumed to be contaminated at the completion of the operation or at the end of the day, whichever occurs first.
- 6) When protective clothing is required, the following guidelines shall be observed.
 - a) Unlined elbow-length gloves shall be worn. They shall be inspected for leaks before they are worn. After a pesticide operation is completed, the gloves shall be washed with soap and water before they are removed. The specific type of glove material is determined by the type and the formulation of the pesticide.
 - b) Coveralls shall be clean and dry. If there is a potential for the coveralls to become wet, a waterproof suit shall be worn over them.
 - c) Boots shall be unlined and cover the ankles. Pant legs shall hang outside of the boots.
 - d) Goggles and/or a full-face shield shall be worn where there is a possibility of pesticide contact with the eyes and/or the face.
 - e) Head and neck protection shall be provided by either a rubber or plastic rain hat, or a waterproof parka with a hood and a bill cap. No cloth head coverings, such as cotton or felt, shall be worn.
 - f) Respirators shall be selected, used, cleaned, and maintained in accordance with ES&H Standard 2.2.2.

b. Care and Maintenance of Protective Clothing

- 1) Disposable clothing that is contaminated shall be discarded as specified in Part V.E.4.a. of this Standard. The methods for laundering reusable clothing that is contaminated depend upon the type of pesticide and level of contamination, therefore the laundering of such clothing should be coordinated through the Safety and Environmental Protection Division representative. Care should be taken to wash pesticide contaminated clothing separately from other clothes.
- 2) When protective clothing or equipment is cleaned, the process shall be conducted in a manner that will prevent washwater wastes from the clothing or equipment from creating either a hazard to the health of employees or an impact on the environment.

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2. Equipment

- a. Pesticide application equipment shall be kept in good repair and adjusted carefully to ensure proper operation.
- b. All items of movable equipment used for handling pesticides at the storage site or elsewhere which might be used for other purposes shall be labeled "Pesticide Contaminated" and should not be removed from the site unless thoroughly decontaminated or packaged properly for subsequent decontamination or disposal.

3. Hygiene Practices

- a. Food, beverages, cigarettes, and other smoking equipment shall not be permitted in an area where pesticides are being stored, mixed, applied, or disposed.
- b. Neither smoking nor consumption of food or beverages shall be permitted while contaminated clothing is worn.
- c. Hands shall be washed with soap and water after handling pesticide containers or pesticide-contaminated equipment and after mixing operations or after any pesticide application. After pesticide application operations are finished, potentially contaminated personnel are required to shower.

G. Emergency Procedures

1. In the event of a pesticide release or spill which results in contact with eyes, skin, and/or clothing, the eyes shall be flushed immediately for at least 15 minutes and the skin shall be washed for at least 15 minutes. The exposed person(s) should then go immediately to the Occupational Medicine Clinic. Immediately upon the occurrence of a significant contact spill, a supervisor or fellow worker shall quickly proceed to the clinic with the appropriate pesticide label or uncontaminated container which gives the chemical characteristics of the substance and the antidote information when available.
2. Appropriate materials such as absorptive clay, hydrated lime, and sodium hypochlorite should be kept on hand for spill containment and detoxification.
3. In emergencies the S&EP representative shall be contacted as soon as possible.

H. Requests for Pesticide Application Service

1. To prevent the occurrence of indiscriminant requests for pesticide treatment in occupied areas of buildings, it is the responsibility of the Department/Division Safety Coordinators (or designee) to request such treatment. This can be accomplished by submitting a verbal or written request to the Maintenance Management Center (x2468) of the Plant Engineering Division.